

26 ECOLOGICAL COMMUNITIES OF FLORIDA, CORRELATED TO THE NATURAL SOIL LANDSCAPE POSITIONS

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NSLP 1: WATER

The water landscape position denotes areas that were described as open water bodies in the county soil surveys. Water areas are permanently inundated, usually to a depth of two feet or more. This includes freshwater, saltwater, natural and excavated sites. There are no specific ecological communities from this publication that correlate to the Water landscape position.

NSLP 2: TIDAL AREAS

Tidal soils are found along coastal areas in salt marshes, mangrove or tidal swamps, and areas adjacent to the Intracoastal Waterway that have tidal flooding influence. These are poorly-drained hydric soils that may have mineral or organic surfaces. The seasonal high water table can range from the soil surface to one foot above the surface throughout the year. Examples of these soils include Wulfert, Durbin, and Estero.

One ecological community that is representative of this landscape position, the Salt Marsh (#18) is described below. Another community, the Mangrove Swamp (#19), is also found on this landscape position.

SALT MARSH (ECOLOGICAL COMMUNITY NO. 18)

Range: The Salt Marsh community occurs along the Atlantic and Gulf Coasts, and inland along tidal rivers. An extensive area occurs along the Gulf of Mexico north of Tarpon Springs to St. Marks. Smaller isolated areas occur inland where salt springs rise near rivers. This community appears as an open expanse of grasses, sedges, and rushes. Usually there is a matrix of interconnected shallow natural channels that aid tidal influx.

Soils: Soils commonly associated with this community are nearly level and very poorly drained. They can be muck or sandy clay loams underlain by loamy sand, or organic soils underlain by clay or sand, or clayey throughout. Many of the soils have a high sulfur content. Some of the soils are soft and will not support the weight of a man or large animal. Tidal action causes saturation of the soil with salt water and inundation to a depth of a few inches. Representative soils include Estero and Wulfert.

Vegetation: Plant species often occur in distinct zones as a result of differing mean water levels and salinity concentrations. Some species, such as black needlerush (*Juncus roemerianus*) and seashore saltgrass (*Distichlis littoralis*), have a wide tolerance range and may be found throughout the grass marsh. Smooth cordgrass (*Spartina alterniflora*) is more indicative of low, regularly flooded marsh, while the high marsh supports sea myrtle (*Baccharis halimifolia*), marsh hay cordgrass (*Spartina patens*), marsh elder (*Iva* spp.), saltwort (*Batis maritima*) and sea oxeye (*Borrchia* spp.). Along the Gulf Coast most marshes are dominated by black needlerush. Other plants that characterize the salt marsh community are: Sea blite (*Suaeda linearis*), sea purslane (*Sesuvium portulacastrum*), and cordgrasses (*Spartina* spp.).

Wildlife: Salt marshes are good habitat for a variety of wildlife. The habitat type is usually maintained by natural forces such as tidal action and periodic hurricanes. Storms usually cause the creation of "open" water in salt and brackish marshes and also may change salinities. The resulting effect is that plant succession is set back and more favorable habitat may be created for waterfowl, furbearers, and some other forms of wildlife such as wading birds. Artificially created dikes to control salinity are used in managing marsh plants for wildlife. Prescribed burning is also a technique used in marsh management.

The salt marshes support a variety of wildlife. Some common species that occur are: Deer (*Odocoileus virginianus*), raccoons (*Procyon lotor*), river otters (*Lutra canadensis*), pelicans, coots, egrets, gulls, terns, many forms of waterfowl. Protected species include the West Indian manatee (*Trichechus manatus latirostris*), Cape Sable seaside sparrow (*Ammodramus maritimus mirabilis*, Collier, Monroe, and Dade Counties only); least tern (*Sterna antillarum*); peregrine falcon (*Falco peregrinus tundrius*), roseate tern (*Sterna dougallii*), bald eagle (*Haliaeetus leucocephalus*), wood stork (*Mycteria americana*), Atlantic green turtle (*Chelonia mydas mydas*), Atlantic hawksbill turtle (*Eretmochelys imbricata imbricata*), American alligator (*Alligator mississippiensis*), Florida ribbon snake (*Thamnophis sauritus sackeni*, Lower Keys population), and the Atlantic saltmarsh water snake (*Nerodia fasciata taeniata*).

Environmental Value as a Natural System: The functions of salt marshes are probably the most important and least understood of all ecological communities. On low energy coastlines and estuaries, the marsh functions as a transition zone from terrestrial to oceanic life. Salt marshes also perform an important function in the stabilization and protection of shorelines, especially during storm tides. Nutrients, sediments and detritus from upland systems are redistributed by tidal action, making the marsh one of the most productive natural ecological systems. The area serves as a habitat for the early life stages of numerous ocean species as they feed on countless invertebrate organisms. Many wildlife forms overlap normal ranges at least seasonally to become harvesters and, in many cases, part of the natural food chain.

Rangeland: Salt marshes have a potential for producing significant amounts of cordgrass, saltgrass, and other grasses and forbs. For sites in excellent condition, the average annual production of air-dried plant materials varies from 4,000 to 8,000 pounds per acre, depending on plant growth conditions. From three to more than fifteen acres are usually needed per animal unit depending upon amount and type of forage available. The relative percentage of annual vegetative production by weight is 90 percent grasses, 5 percent shrubs and trees, and 5 percent herbaceous plants and vines.

Woodland: These soils are unsuitable for commercial wood production.

Urbanland: This community is subject to a high water table and periodic flooding. Therefore, it has very severe limitations for urban development. Very elaborate water management systems are required for urban uses. It is difficult to establish salt tolerant vegetation on steep channel side slopes and infertile spoil. Special techniques such as mulching, and unusual seeding and management techniques, will be required. Without vegetation, erosion and sedimentation become a problem. Intensive measures may also be required to maintain design capacity. Native plants can be used for beautification and require minimum establishment and maintenance. Some of the trees and shrubs are black mangrove (*Avicennia germinans*), button mangrove (*Conocarpus erectus*), necklace pod (*Sophora tomentosa*), sea oxeye, southern red cedar (*Juniperus silicicola*), and white mangrove (*Laguncularia racemosa*). Some of the herbaceous plants are asters and goldenrod (*Solidago spp.*). Some of the grasses are the cordgrasses, seashore dropseed (*Sporobolus virginicus*), and seashore saltgrass.

NSLP 3: MARL AND ROCKY SOILS

The Marl and Rocky Soil landscape denotes that area near the southern tip of the Florida peninsula typically adjacent to the tidal area of Florida Bay. These soils occur entirely within Dade, Monroe, and Collier counties along the southern extent of the Everglades. Marl soils are hydric and originate from the precipitation of calcite in the water by calcareous algae mats. Rocky soils have exposed limestone at or near the surface. The seasonal high water table ranges from one foot below to one foot above the soil surface for four to six months annually. Some areas are noted as drained phases, which means that there has been artificial drainage implemented, however the degree or effectiveness of the drainage is not expressed.

There is no ecological community that is typical of this position, however the Scrub Cypress ecological community (#16, described below) is a unique community that can be found in this type of landscape. Other ecological communities that also may occur are the Salt Marsh (#18), Sawgrass Marsh (#24), Freshwater Marsh (#25), and Slough (#26).

SCRUB CYPRESS (ECOLOGICAL COMMUNITY NO. 16)

Range: The Scrub Cypress ecological community occurs only in south Florida on marl and rock that is frequently flooded. Eastern Collier County and northern Monroe County have the largest areas of this community. This region is called "Big Cypress." This community appears as a broad area of marshes with dwarf cypress (less than 20 feet tall) scattered throughout. It is stressed by the extreme seasonal change in water levels, and low level of plant nutrients. These factors cause poor growing conditions with a lack of plant diversity and small wildlife populations in comparison to the cypress swamp community.

Soils: The soils associated with this community are nearly level, poorly to very poorly drained, with coarse to medium textured surfaces underlain by finer textured material or fractured limestone. A representative soil is Margate.

Vegetation: The vegetation is much like that of the freshwater marsh community. Occasional air plants and orchids can be found in the scattered cypress trees. Plants which characterize this community are: bald cypress (*Taxodium distichum*), pond cypress (*Taxodium distichum* var. *nutans*), waxmyrtle (*Myrica cerifera*), stiff-leaved wild pine (*Tillandsia fasciculata*), yellow-eyed grass (*Xyris* spp.), blue maidencane (*Amphicarpum muhlenbergianum*), bluejoint panicum (*Panicum tenerum*), chalky bluestem, (*Andropogon capillipes*), cutgrass (*Leersia hexandra*), gulfdune paspalum (*Paspalum monostachyum*), maidencane (*Panicum hemitomon*). The following protected plant species may be found in or around this community: Acuna's epidendrum (*Epidendrum acunae*), auricled spleenwort (*Asplenium auritum*), bird's nest spleenwort (*Asplenium serratum*), cow-horn orchid (*Cyrtopodium punctatum*), dwarf epidendrum (*Encyclia pygmaea*), hidden orchid (*Maxillaria crassifolia*), leafless orchid (*Campylocentrum pachyrrhizum*), night-scent orchid (*Epidendrum nocturnum*), and nodding catopsis (*Catopsis nutans*).

Wildlife: The poor soil and lack of plant nutrients that are responsible for the relatively sparse plant life also account for a fairly scattered wildlife population. This community is one of the least productive of wildlife. Deer (*Odocoileus virginianus*) will range through these areas, but the habitat is poor. The primary value is seasonal to frogs, turtles, snakes, and salamanders which can adjust to the short hydroperiod. It is also use by predators of these animals such as raccoons (*Procyon lotor*), mink (*Mustela vison*), and wading birds. Other wildlife species include: Bobcat (*Lynx rufus*), and herons. The following protected animal species may be found in or around this community: Florida panther (*Felis concolor coryi*), roseate spoonbill (*Ajaja ajaja*), wood stork (*Mycteria americana*), American alligator (*Alligator mississippiensis*).

Environmental Value as a Natural System: The scrub cypress community occurs primarily in southwest Florida. Developments in and around the community cause changes in water quality and quantity which results in wide changes in portions of the plant community. The scrub cypress community is highly endangered. Scrub cypress swamps provide water storage areas by holding excess water and slowly releasing it into the water table. Water quality is enhanced by the community, which functions like a waste treatment plant by absorbing nutrients from the water.

Rangeland: This ecological community has the potential for producing significant amounts of high quality forage such as South Florida bluestem, gulfdune paspalum, chalky bluestem, and bluejoint panicum. For sites in excellent condition, the average annual production of air dry plant material varies from 1,500 to 4,500 pounds per acre. The variation depends on plant growth conditions. From nine to more than twenty-two acres are usually needed per animal unit depending upon amount and type of forage available. The relative percentages of annual vegetative production by weight is 75 percent grasses and grass-like plants, 15 percent trees and shrubs, and 10 percent herbaceous plants.

Woodland: These areas are not generally used for commercial woodland production. However, this community does have a moderate potential productivity for commercial woodland production on areas with adequate surface drainage. There are severe equipment limitations due to the poorly drained soil conditions. Slash pine is the species suitable for planting on areas with adequate surface drainage. Potential annual growth is 0.7 cords per acre.

Urbanland: This community is subject to periodic flooding and has severe limitations for urban development. Elaborate water management systems are required for urban uses. It is difficult to establish vegetation on steep channel side slopes and infertile spoil. Special techniques such as mulching, selected plants, and unusual seeding and plant management techniques may be required. Native plants can be used for beautification and require minimum establishment and maintenance. Some of the trees are bald cypress, cabbage palm (*Sabal palmetto*), pond cypress and slash pine (*Pinus elliotii* var. *densa*). Some of the shrubs are buttonbush (*Cephalanthus occidentalis*), dahoon holly (*Ilex cassine*), and waxmyrtle.

NSLP 4: Everglades Peat

Everglades Peat soils are poorly-drained organic hydric soils, usually derived from sawgrass (*Cladium jamaicense*), that have formed over limestone bedrock. These soils are normally found within the extent of the historic Everglades Basin. Typically, these are pure mucks with no significant sand layer deposit between the surface organic layer and the limestone bedrock. The seasonal high water table can range from the soil surface to two feet above the surface for nine to twelve months annually. Examples of these soils include Dania, Pahokee, and Terra Ceia. Organic soils with a sand layer on the western and eastern boundaries of the Everglades basin have been placed in NSLP #5 (Sand Depressions) because they are morphologically different from the pure peat soils.

The ecological community most typical of this landscape position is the Sawgrass Marsh (#24), described below. Freshwater Marsh and Ponds (#25) may also be found in areas with slightly deeper water.

SAWGRASS MARSH (ECOLOGICAL COMMUNITY NO. 24)

Range: The Sawgrass Marsh ecological community occurs south of Lake Okeechobee in the historic Everglades Basin. This community covers many thousands of acres. Smaller sawgrass marshes are found outside of this area, but they are included in the Freshwater Marsh and Ponds ecological community (#25).

Soils: Soils commonly associated with this community are nearly level and very poorly drained organic surfaces underlain by limestone. Representative soils are Torrey and Terra Ceia.

Vegetation: The natural vegetation of this community is dominated by sawgrass. Muhly grass (*Muhlenbergia capillaris*) increases and becomes obvious when the sawgrass is repeatedly exposed to fire and the hydroperiod is shortened. With natural conditions, the vigorous sawgrass is 6 to 10 feet tall and of such density that few other plants can survive. Other marsh plants invade where marginal conditions occur for sawgrass growth, such as shallow organic soils and areas where the period of water submergence is short. Trees are not characteristic of this community, but a few may occur on the banks of gator holes. Plants that characterize this community are sawgrass, gulf muhley (*Muhlenbergia capillaris* var. *filipes*), plume grass (*Erianthus spp.*), and pickerelweed (*Pontederia cordata*).

Wildlife: Numerous birds use this community year-round or for over-wintering. Frogs, snails, and crayfish are common and serve as food for larger animals. Animals that commonly occur in this community include: Deer (*Odocoileus virginianus*), red-winged blackbirds (*Agelaius phoeniceus*), egrets, herons, ibis, bitterns, and water snakes. Protected species that may be found in or around the sawgrass community include: Everglades mink (*Mustela vison evergladensis*), Florida panther (*Felis concolor coryi*), snail kite (*Rostrhamus sociabilis*), wood stork (*Mycteria americana*), and American alligator (*Alligator mississippiensis*).

Environmental Value as a Natural System: The sawgrass marshes serve as filter systems for water. They protect natural bodies of water from eutrophication. Marshes can help moderate drought and flood events. Their principal environmental values are related to water quality and quantity. Tall, dense sawgrass occurs in deep organic soils and requires water coverage of the rhizomes for most of the year. It also forms extensive, but shorter and less dense stands on marl soils in South Florida. Drainage, organic soil subsidence, and fires have reduced the amount of sawgrass and promoted the growth of other plants in many areas. Although the sawgrass community is one of the most resistant communities to change under natural conditions, severe fires and water quality reduction can completely alter the community's characteristics within 10 to 20 years.

Rangeland: This site provides little to no native forage values.

Woodland: This community is not generally recommended for woodland.

Urbanland: This community is subject to very high water tables and has severe limitations for urban development. Intensive and complex water management systems are required for urban uses. It is often difficult to establish vegetation on steep channel side slopes and infertile spoil. Special techniques are usually required in these situations. Without vegetation, erosion and sedimentation can become a problem. Much of the sawgrass marsh is now included in public lands and is not available for urban uses.

NSLP 5: Muck Depressions

Muck Depression soils are poorly-drained hydric soils that have an organic surface layer underlain by sandy marine sediments. This category includes the transitional area between the Everglades pure organic soils (NSLP #4) and the coastal sandy marine sediments. These areas are often depressions adjacent to Flats (NSLP #7) and Flatwood (NSLP #8) landscapes. The seasonal high water table can range from one foot below to two feet above the soil surface for nine to twelve months annually. Examples of these soils include Gator, Hontoon, and Sanibel. Some areas within this unit are frequently flooded alluvial areas that have a muck surface for the majority of the area. These frequently flooded map units are known to have surface flooding at least one out of every two years. A few areas may have a thin organic surface layer less than a few inches thick.

Wetland communities dominate this landscape. An ecological community often found in this landscape is the Cypress Swamp (#17), described below. Other ecological communities that may also occur include Freshwater Marsh and Ponds (#25), Wetland Hardwood Hammocks (#12), Swamp Hardwoods (#21), Shrub Bogs-Bay Swamps (#22), and Sawgrass Marsh (#24).

CYPRESS SWAMP (ECOLOGICAL COMMUNITY NO. 17)

Range: The Cypress Swamp ecological community occurs along rivers, lake margins, slough and strands, or interspersed throughout other communities such as Flats (NSLP #7) and Flatwoods (NSLP#8). It occurs throughout Florida, but is the predominant swamp type in the area from Flagler county south through Polk county, and in southwest Florida. The "Big Cypress" area of Monroe and Collier counties is included in ecological community #16- Scrub Cypress.

Soils: This community is poorly drained and water is at or above ground level a good portion of the year. Soils commonly associated with this community are nearly level or depressional, poorly drained and have loamy subsoils and sandy surfaces.

Vegetation: Bald cypress (*Taxodium distichum*) is the dominant tree and is often the only plant which occurs in significant numbers. The diversity of tree species is low in cypress heads but increases in strands and along stream margins. The submergence or saturated condition of the soil and general absence of fire help reduce competition and keeps the community from a successional change to a swamp hardwood (bayhead) community. Cypress swamps growing on sand, rock, and shallow mucky pond areas are not as productive as those found on alluvial flood plain soils. Plants which characterize this community are: bald cypress, pond cypress (*Taxodium distichum* var. *nutans*), coastal plain willow (*Salix caroliniana*), red maple (*Acer rubrum*), buttonbush (*Cephalanthus occidentalis*), waxmyrtle (*Myrica cerifera*), cinnamon fern (*Osmunda cinnamomea*), royal fern (*Osmunda regalis*), Spanish moss (*Tillandsia usneoides*), stiff-leaved wild pine (*Tillandsia utriculata*), and maidencane (*Panicum hemitomon*). Some of the protected plants that may be found in this ecological community include the bird's nest spleenwort (*Asplenium serratum*), climbing dayflower (*Commelina gigas*), fuzzy-wuzzy airplant (*Tillandsia pruinosa*), giant water dropwort (*Oxypolis greenmanii*), hidden orchid (*Maxillaris crassifolia*), nodding catopsis (*Catopsis nutans*), and grass-of-Parnassus (*Parnassia graniflora*).

Wildlife: This community is very important as a wildlife refuge and roosting area. It is well-suited for waterfowl and wading birds. Aquatic animals may be found in large numbers. The permanent residents of cypress heads are relatively few, but much of the wildlife of the flatwoods is dependent on these ponds for breeding purposes. The most common wildlife species include: Deer (*Odocoileus virginianus*), raccoons (*Procyon lotor*), river otters (*Lutra canadensis*), Anhinga (*Anhinga anhinga*), barred owl (*Strix varia*), egrets, herons, limpkins (*Aramus guarauna*), pileated woodpecker (*Drycopus pileatus*), wood ducks (*Aix sponsa*), frogs, turtles, and a variety of water snakes. Some protected animal species that may be found in this ecological community include Everglades mink (*Mustela vison evergladensis*), wood stork (*Mycteria americana*), American alligator (*Alligator mississippiensis*), bald eagle (*Haliaeetus leucocephalus*), and the Florida black bear (*Ursus americanus floridanus*).

Environmental Value as a Natural System: Cypress swamps are an extremely valuable resource. They can be used for environmental education study, scientific research, and recreation. They have a high value for use as wildlife habitat. This community has a relatively low diversity of plant species due to fluctuating water levels and low nutrient availability. Both drastic changes in mean water level and a stabilized water level may change the plant community. Often this will occur due to the effects of dams, dikes, or drainage channels. Stagnant water will result in slow tree growth especially if it occurs during the growing season. Natural regeneration of cypress requires fluctuation of the water and flooding during the dry season will prevent the cypress trees from reproduction.

Rangeland: This community has little or no value as rangeland.

Woodland: Extensive drainage would be required, thereby destroying this community.

Urbanland: This community is subject to periodic flooding and has severe limitations for urban development. Elaborate water management systems are required for urban uses. It is often difficult to establish vegetation on steep channel side slopes and infertile spoil. Special techniques such as mulching, special plants, and unusual maintenance techniques may be required. Without vegetation, erosion and sedimentation are a problem. Intensive management measures may also be necessary to maintain design capacity. Native plants can be used for beautification and require minimum establishment and maintenance. Some trees that can be used for this purpose are bald cypress, buttonwood (*Conocarpus erectus*), loblolly bay (*Gordonia lasianthus*), pond cypress, red maple, slash pine (*Pinus elliottii* var. *densa*), and sweet gum (*Liquidambar styraciflua*). Some of the shrubs are buttonbush, coco-plum (*Chrysobalanus icaco*), dahoon holly (*Ilex cassine*), and waxmyrtle. Some herbs include asters, golden canna (*Canna flaccida*), cardinalflower (*Lobelia cardinalis*), pineland lily (*Lilium catesbaei*), ferns, coneflowers (*Rudbeckia* spp.), cattails (*Typha* spp.), rosemallow (*Hibiscus* spp.), and meadowbeauty (*Rhexia* spp.).

NSLP 6: Sand Depressions

Sand Depression soils are poorly-drained hydric soils that typically have sandy marine sediments throughout the profile. A few areas may have mucky sand, loamy sand, or sandy loam surfaces with sandy or loamy subsurfaces. Often, these areas are depressions adjacent to Flats (NSLP #7) and Flatwood (NSLP #8) landscapes. The seasonal high water table can range from one foot below to two feet above the soil surface for nine to twelve months annually. Some areas within this unit are frequently flooded alluvial areas that have a sandy surface for the majority of the area. These frequently flooded map units are known to have surface flooding at least one out of every two years. Examples of Sand Depression soils include Basinger, Boca, Chobee, Felda and Riviera.

Wetland communities dominate this landscape position. An ecological community often found in this landscape is the Freshwater Marsh and Ponds (#25), described below. Other ecological communities that may also occur include Cypress Swamp (#17), Wetland Hardwood Hammocks (#12), Swamp Hardwoods (#21), and Shrub Bogs-Bay Swamps (#22).

FRESHWATER MARSH AND PONDS (ECOLOGICAL COMMUNITY NO. 25)

Range: The Freshwater Marsh and Ponds ecological community occurs throughout Florida. Individual communities vary widely in size. The largest communities, several thousand acres in size, generally occur in southeast Florida.

Soils: Soils commonly associated with this community are nearly level and very poorly drained with organic surfaces underlain by sand. Representative soils include Hontoon, Sanibel, and Okeelanta.

Vegetation: Within Florida, eight major different types of freshwater marshes have been described. Any one marsh may be composed of combinations of different major types. The types are: flag marshes, sawgrass marshes, arrowhead marshes, fire flag and other non-grass herbs marshes, cattail marsh, spike-rush marsh, bulrush marsh, and maidencane marsh. Plants that characterize this community may include: Beak rushes (*Rhynchospora* spp.), bulrushes (*Scirpus* spp.), maidencane (*Panicum hemitomon*), sawgrass (*Cladium jamaicense*), and spike rushes (*Eleocharis* spp.), arrowhead (*Sagittaria* spp.), cattail (*Typha* spp.), pickerelweed (*Pontederia cordata*), and primrose willow (*Ludwigia* spp.).

Wildlife: Freshwater marshes and ponds provide excellent habitat for many wildlife species. Numerous birds and waterfowl use this community for over-wintering or year-round. Animals that commonly occur in this community are: River otters (*Lutra canadensis*), raccoon (*Procyon lotor*), marsh rabbits (*Sylvilagus palustris*), deer (*Odocoileus virginianus*), Florida water rat (*Neofiber alleni*), herons, egrets, bitterns, ibis, rails, limpkins (*Aramus guarauna*), snipes (*Gallinago* spp.), killdeer (*Charadrius vociferus*), ducks, hawks, frogs, turtles, and snakes. Some protected animal species that may be found in this ecological community include Everglades mink (*Mustela vison evergladensis*), Key Vaca raccoon (*Procyon lotor auspicatus*, middle Florida Keys only), silver rice rat (*Oryzomys agentatus*), Cape Sable seaside sparrow (*Ammodramus maritimus mirabilis*), crested caracara (*Polyborus plancus audubonii*), Florida sandhill crane (*Grus canadensis pratensis*), snail kite (*Rostrhamus sociabilis*), wood stork (*Mycteria americana*), American alligator (*Alligator mississippiensis*), Florida ribbon snake (*Thamnophis sauritis sackeni*, Keys population only), Keys mud turtle (*Kinosternon bauri bauri*, Keys population only).

Environmental Value as a Natural System: Freshwater marshes and ponds serve as filter systems for rivers and lakes. This protects these waterbodies from eutrophication and provides the marsh with nutrients that are used in vegetative growth. Marshes can reduce the impacts of drought and flooding. Fire and water level fluctuations are the major factors affecting these wetland areas. Variations in the water patterns on the marsh will change the plant diversity and productivity. Marsh-prairie systems will eventually move to a woody community with exclusion of fire or with permanent and lower water level changes. The freshwater marsh community is highly endangered. Many have been destroyed or at least degraded. Some examples of areas where drainage has occurred for reclamation of land and for agricultural interests are: The Everglades, Kissimmee River marshes, Lake Isotokpoga marsh, and the upper St. Johns River marsh. Recreational uses of this community can cause much disturbance and may alter the plant community.

Rangeland: This ecological community has the potential for producing significant amounts of high-quality forage. For sites in excellent condition, the average annual production of air-dried plant material varies from 5,000 to 10,000 pounds per acre, depending on plant growth conditions. From three to more than thirteen acres are usually needed per animal unit depending upon amount and type of forages available. The relative percentage of annual vegetative production by weight is 80 percent grasses and grass-like plants, 5 percent trees and shrubs, and 15 percent herbs.

Woodland: This community is not generally recommended for woodland, unless drainage has been provided.

Urbanland: This community is subject to periodic flooding and has severe limitations for urban development. Intensive and complex water management systems are required for urban uses. It is often difficult to establish vegetation on steep channel side slopes and infertile spoil. Special techniques are usually required in these situations, such as mulching, special plants, and unusual management. Without vegetation, erosion and sedimentation can become a problem. Native plants can be used for beautification and require minimum establishment and maintenance. Some of the trees are buttonbush (*Cephalanthus occidentalis*), coastal plain willow (*Salix caroliniana*), and persimmon (*Diospiros virginiana*). Some of the shrubs are elderberry (*Sambucus canadense*) and waxmyrtle (*Myrica cerifera*). Some of the herbs are golden canna (*Canna flaccida*), cardinalflower (*Lobelia cardinalis*), coneflowers (*Rudbeckia* spp.), marsh pink (*Sabatia* spp.), and meadow beauty (*Rhexia* spp.).

NSLP 7: Flats

Flats (previously referred to as "sloughs") soils are poorly-drained hydric soils with sandy marine sediments throughout the profile, or more rarely with loamy sand or sandy loam. Some areas within this unit are frequently flooded alluvial areas that have a sandy surface for the majority of the area. Flats are located between the Flatwood (NSLP #8) and depressional landscapes (NSLP #5 or #6), and are generally regarded as transitional areas. The seasonal high water table can range from the soil surface to one foot below the surface for five to ten months annually. Some areas may be inundated for less than a few weeks by large storm events. Examples of these soils include Boca, Felda, and Riviera. Wet-dry prairies dominated by grasses are typical to this landscape position.

One of the ecological communities that is most typical of the Flats landscape is the Slough (#26), described below. Other communities that may also be found are Everglades Flatwoods (#9), Cutthroat Seeps (#10), Cabbage Palm Hammocks (#13), and Tropical Hammocks (#14).

SLOUGH (ECOLOGICAL COMMUNITY NO. 26)

Range: The Slough ecological community occurs throughout central and southern Florida, but mostly in the latter. Individual communities vary widely in size. Most serve as drainage-ways for water during periods of heavy and prolonged rainfall. This slough community occurs in a slightly lower position adjacent to the South Florida Flatwoods ecological community (#6).

Soils: Soils commonly associated with this community are nearly level and very poorly drained with organic surfaces underlain by sand. Representative soils include Hontoon, Sanibel, and Okeelanta.

Vegetation: This community appears as an open expanse of grasses, sedges, and rushes with scattered pines and cypress in an area where the surface soil is saturated during the wet season. Surface water may move over this area for up to a few weeks during the rainy season. Most sloughs are relatively long and narrow and slightly lower in elevation than the surrounding flatwoods or hammocks. Grasses are the most common plants found in sloughs. Plants that characterize this community are: St. Peters wort (*Ascyrum stans*), pickerelweed (*Pontederia cordata*), sundew (*Drosera spp.*), marsh pink (*Sabatia spp.*), meadowbeauty (*Rhexia spp.*), milkwort (*Polygala spp.*), beak rushes (*Rhynchospora spp.*), blue maidencane (*Amphicarpum muhlenbergianum*), and sloughgrass (*Scleria spp.*).

Wildlife: This community is productive in regards to food for bobwhite quail (*Colinus virginianus*), deer (*Odocoileus virginianus*), and wading birds. Its low-growing vegetative growth provides poor cover for most wildlife species, but this is often offset by the "edge effect" of this community when it is located with flatwoods. Sloughs are host to a diverse wildlife population. Many larger animals occur where sloughs join flatwoods and hammocks. Typical animals of the sloughs are: Bobcat (*Lynx rufus*), gray fox (*Urocyon cinereoargenteus*), marsh rabbit (*Sylvilagus palustris*), opossum (*Didelphis virginiana*), cotton rat (*Sigmodon hispidus*), raccoon (*Procyon lotor*), egrets, herons, ibis, meadowlark (*Sturnella spp.*), hawks, snipes (*Gallinago spp.*), snakes, and frogs. Some of the threatened or endangered animals include the Florida panther (*Felis concolor coryi*) and the Florida sandhill crane (*Grus canadensis pratensis*).

Environmental Value as a Natural System: Sloughs serve as natural drainageways during high water periods. They also retain water, help slow down water flows, and thereby increase water quantity and improve water quality. Fire and artificial water level fluctuations are the major factors affecting these areas. Variations in the natural sequences of either event will change the slough's diversity and productivity. With the exclusion of fire or permanent water level reduction, the plant succession will be to a wooded community.

Rangeland: Native forage production is good with proper management. Use for rangeland has only a slight effect on the community if properly managed. The community has good wildlife values, especially with proper management. The installation of water control practices have facilitated the use of some sloughs for improved pasture, vegetables, and citrus. This ecological community has the potential for producing significant amounts of high quality forage such as blue maidencane (*Amphicarpum muhlenbergianum*), chalky bluestem, (*Andropogon capillipes*), and bluejoint panicum (*Panicum tenerum*). For sites in excellent condition, the average annual production of air-dried plant material varies from 4,000 to 8,000 pounds per acre. This variation depends on plant growth conditions. From three to more than 16 acres are usually needed per animal unit depending upon amount and type of forage available. The relative percentages of annual vegetative production by weight is 90 percent grasses and grass-like plants, 10 percent herbaceous plants.

Woodland: This community is not generally recommended for commercial woodland, unless drainage has been provided.

Urbanland: This community is subject to high water tables, especially during the rainy season. This causes limitations for urban development and water management systems are required. It is often difficult to establish vegetation on steep channel side slopes and infertile spoil. Special planting techniques are usually required. Without adequate vegetation, erosion and sedimentation is usually a problem. Severe wind erosion can also occur, especially in the spring. Native plants can be used for beautification and require minimum establishment and maintenance. Some of the shrubs are saw palmetto (*Serenoa repens*) and waxmyrtle (*Myrica cerifera*). Some of the herbs are asters, coneflowers (*Rudbeckia* spp.), marsh pink (*Sabatia* spp.), and meadow beauty (*Rhexia* spp.).

NSLP 8: Flatwood Soils

Flatwood soils are poorly-drained non-hydric, upland soils with sandy marine sediments throughout the profile. Most of the soils series have a subsurface spodic horizon, some of which may have loamy sand substrates. The seasonal high water table can range from six inches to one and one-half feet below the soil surface for three to six months annually. Some areas may become inundated for less than a couple weeks during large storm events. Examples of these soils include Immokalee, Malabar, and Wabasso.

One ecological community which is typical of Flatwood Soils is the South Florida Flatwoods (#6), described below. Other communities that may also be found in this landscape include Cabbage Palm Flatwoods (#8), Upland Hardwood Hammocks (#11), Wetland Hardwood Hammocks (#12), Cabbage Palm Hammocks (#13), and Oak Hammocks (#15).

SOUTH FLORIDA FLATWOODS (ECOLOGICAL COMMUNITY NO. 6)

Range: The South Florida Flatwoods ecological community occurs throughout south and central Florida. The northern limit of its occurrence is approximately on a line from Levy County on the west to St. Johns County on the east. This community covers more land area than any other in south Florida. Individual communities may comprise several thousand acres and are typically interspersed with smaller communities of other types, especially wetlands. This community occurs on nearly level land. Water movement is very gradual to the natural drainageways, swamps, marshes, and ponds associated with this community. During the rainy season, usually June through September, this community may have water on or near the soil surface. It is easily identified by the flat topography and pine and palmetto vegetation.

Soils: The soils are nearly level, deep, acid, poorly to somewhat poorly drained. They are usually course textured in the upper part and variably textured below. Representative soils include: Electra, Immokalee, and Myakka.

Vegetation: The landscape position of this community affects plant-water relationships and causes slight differences in plant composition from wetter to drier areas. Although these differences are recognized, they are not significant enough to delineate as separate communities. The natural vegetation of this community is typically scattered pine trees with an understory of saw palmetto (*Serenoa repens*) and grasses. Some of these areas in south Florida have few, if any, trees. These are often called prairies or dry prairies. The largest of these areas occur north and west of Lake Okeechobee. Plants which characterize this community are: Live oak (*Quercus virginiana*), South Florida slash pine (*Pinus elliottii* var. *densa*), ground blueberry (*Vaccinium myrsinites*), gallberry (*Ilex glabra*), tarflower (*Befaria racemosa*), shining sumac (*Rhus copallina*), waxmyrtle (*Myrica cerifera*), chalky bluestem (*Andropogon capillipes*), South Florida bluestem (*Schizachyrium rhizomatum*), pineland threeawn (*Aristida stricta*).

Wildlife: The South Florida Flatwoods community is host to a diverse and numerous wildlife population. Many larger animals are found in areas where the flatwoods join other communities. These ecotones provide nesting sites, den sites, food and cover. Typical animals of the flatwoods are: Armadillo (*Dasypus novemcinctus*), rabbits, cotton rat (*Sigmodon hispidus*), deer (*Odocoileus virginianus*), eastern spotted skunk (*Spilogale putorius*), raccoons (*Procyon lotor*), opossum (*Didelphis virginiana*), Bachman's sparrow (*Aimophila aestivalis*), bobwhite quail (*Colinus virginianus*), brown-headed nuthatch (*Sitta pusilla*), eastern meadowlark (*Sturnella magna*), pileated woodpecker (*Dryocopus pileatus*), pine warblers (*Dendroica pinus*), rufous-sided towhee (*Pipilo erythrophthalmus*), eastern diamondback rattlesnake (*Crotalus adamanteus*), oak toad (*Bufo quercicus*), pinewoods tree frog (*Hyla femoralis*). Introduced feral hogs are common in much of the community. The following endangered or threatened wildlife species may be found in or around this community: Florida panther (*Felis concolor coryi*), mangrove fox squirrel (*Sciurus niger avicennia*), crested caracara (*Polyborus plancus*), Florida grasshopper sparrow (*Ammodramus savannarum floridanus*), southeastern kestrel (*Falco sparverius paulus*), red-cockaded woodpecker (*Picoides borealis*), bald eagle (*Haliaeetus leucocephalus*), Florida sandhill crane (*Grus canadensis pratensis*), eastern indigo snake (*Drymarchon corais couperi*).

Environmental Value as a Natural System: Fire and Water are the major stress conditions of this community. Fire controls hardwoods and promotes the natural regeneration of pine. Removal of fire will cause a successional move to a hardwood community. Flatwood communities are good cellulose producers and the original areas of predominantly longleaf pine have been logged. Areas in the northern part of the community are extensively used for timber production. Intensive management for pulp production can cause major changes in the vegetation. Without proper consideration this results in a low diversity of plants and an adverse change in some wildlife populations. This community has good wildlife values, especially with proper management. It is especially important as a wildlife buffer zone between urban areas occurring on better drained sites.

Rangeland: This ecological community has the potential for producing significant amounts of high quality native forage such as chalky bluestem, and indiangrass (*Sorghastrum* spp.). It is Florida's most important community for the production of cattle on native range. For sites in excellent condition, the average annual production of air dry plant material varies from 3,000 to 6,000 pounds per acre. The variation depends on plant growth conditions. From four to more than eighteen acres are usually needed per animal unit depending upon amount and type of forage available. There will be little forage available if the canopy cover exceeds 60 percent. The relative percentages of annual vegetative production by weight is 75 percent grasses and grass-like plants, 15 percent trees and shrubs, and 10 percent herbaceous plants.

Woodland: This community has a moderate potential productivity for commercial wood production. There are moderate equipment limitations and seedling mortality due to wet soil conditions. The commercial species suitable for planting is slash pine. Potential annual growth is 0.9 cords per acre. The potential annual growth for longleaf pine is 0.5 cords per acre. Potential productivity is 18 percent less for soils south of a line from Hernando County in the west to Orange County in the east.

Urbanland: This community is subject to high water tables during the rainy season and has limitations for urban development. Water management systems are required for urban uses. It is often difficult to establish vegetation on steep channel side slopes and infertile soil and special techniques may be required. Without vegetation, erosion and sedimentation is often a problem in some water management systems. Wind erosion is a problem in unvegetated areas. This is especially severe in the spring. Native plants can be used for beautification and require minimum establishment and maintenance. Some of the trees are: Cabbage palm (*Sabal palmetto*), persimmon (*Diospiros virginiana*), live oak (*Quercus virginiana*), and slash pine (*Pinus elliottii* var. *densa*). Some of the shrubs are: American beautyberry (*Callicarpa americana*), coontie (*Zamia pumila*), coral bean (*Erythrina herbaceae*), partridge pea (*Cassia* spp.), pawpaw (*Asimina reticulata*), saw palmetto (*Sabal palmetto*), shining sumac (*Rhus copallinum*), tarflower (*Befaria racemosa*), and waxmyrtle (*Myrica cerifera*). Some of the herbaceous plants are: Blazing star (*Liatris* spp.), pine lily (*Lilium catesbaei*), asters, meadowbeauty (*Rhexia* spp.), and zephyrlily (*Zephyranthes* spp.).

NSLP 9: Knolls

Knolls soils are non-hydric, upland soils with sandy marine sediments throughout the profile. These soils typically have no unique diagnostic horizons within the soil profile and are well to somewhat poorly drained. The seasonal high water table can range from one and one-half feet to six feet below the soil surface for four to seven months annually. Examples of these soils include Archbold, Canaveral, and Pomello.

One ecological community that is typical to Knolls landscape is the Sand Pine Scrub (#3), described below. Other communities include the Oak Hammock (#15), Upland Hardwood Hammock (#11), and Everglades Flatwoods (#9).

SAND PINE SCRUB (ECOLOGICAL COMMUNITY NO. 3)

Range: The Sand Scrub ecological community occurs throughout Florida. It is most commonly found inland from the coast and in the central portion of the state in and around Marion County. Individual communities are generally small in size, i.e. several hundred acres, and a few remnants still exist along the southeast coast in Palm Beach and Martin counties. A large community, several thousands of acres in size, occurs just east of Ocala in the Ocala National Forest. It typically has a few smaller communities of wetland types interspersed throughout.

Soils: The soils are nearly level to strongly sloping, deep, acid, somewhat poorly to excessively drained and course textured throughout. Representative soils include Archbold and Pomello.

Vegetation: The natural vegetation of this community may be typically even-aged sand pine trees with a dense understory of oaks, saw palmetto (*Serenoa repens*), and other shrubs. Ground cover under the trees and shrubs is scattered and large areas of light colored sand are often noticeable. In other cases, the sand pine are scattered or absent, with oaks being the dominant vegetation. Satellite soils, which have a high water table for part of the year, support scrubby growth also, but the myrtle oak, Chapman oak, and sand pine become infrequent and gallberry (*Ilex glabra*) becomes prominent. Plants which characterize this community are: Chapman oak (*Quercus chapmannii*), myrtle oak (*Quercus mytifolia*), sand live oak (*Quercus virginiana* var. *geminata*), sand pine (*Pinus clausa*), gopher apple (*Chrysobalanus oblongifolius*), prickly pear (*Opuntia* spp.), saw palmetto, grassleaf goldenaster (*Heterotheca graminifolia*), deermoss (*Cladonia* spp.), cat greenbriar (*Smilax glauca*), yellow Indian grass (*Sorghastrum nutans*), low panicum (*Panicum* spp.). The following protected plants may occur in this community: Four-petal pawpaw (*Asimina tetramera*), pigmy fringetree (*Chionanthus pyfmaea*), Curtis' milkweed (*Asclepias curtissii*), dancing-lady orchid, (*Tolumnia bahamense*), Florida bonamia (*Bonamia grandiflora*).

Wildlife: Animals found in this community are adapted to high temperatures and droughty conditions. The wildlife food production is low. Dense vegetation provides good escape cover for animals such as deer (*Odocoileus virginianus*). The palmetto, various species of oaks and gopher apple provide good food sources. Typical animals of the sand scrub are: Towhee (*Popilo erythrophthalmus*), great crested flycatcher (*Myiarchus crinitus*), Bachman's sparrow (*Aimophila aestivalis*), black racer (*Coluber constrictor*), gopher tortoise (*Gopherus polyphemus*), scrub lizard (*Sceloporus woodi*), gopher frog (*Rana areolata*). The following protected wildlife species may be found in or around this community: Goff's pocket gopher (*Geomys pinetis goffi*), Florida scrub jay (*Aphelocoma coerulescens coerulescens*), blue-tailed moleskink (*Eumeces egregius lividus*), sand skink (*Neoseps reynoldsi*), short-tailed snake (*Stilosoma extenuatum*).

Environmental Value as a Natural System: The sand scrub is a fire-based community. Understory vegetation is dense and fuel supplies build up in the trees. The thick understory creates a pathway for fire to the crowns of the trees. Fire normally occurs every 20 to 40 years. Sand pines have a low resistance to fire and the high density, even-aged stands make fire devastating. Cones of the sand pine require the heat of a fire to open and release seeds. This method of regeneration helps to form even-aged stands. Without occasional fire, this community would tend to become a type of upland hammock community. The sand scrub is a valuable ecological community. The coarse textured, excessively well drained soils make the community important in aquifer recharge. It is a unique ecosystem which gives it an important scientific value. Heat and drought stress response by plants and animals are often studied on these sites. Uncontrolled fire and damage to vegetation by excessive foot or vehicle travel have adverse effects on the community.

Rangeland: This community supports a fairly dense stand of trees and shrubs and therefore has a limited potential for producing native forage. Livestock do not use this site if other ecological communities are available. For sites in excellent condition the average annual production of air dry plant material varies from 1,500 to 3,500 pounds per acre. The variation depends on plant growth conditions. From fifteen to more than forty acres are usually needed per animal unit depending upon amount and type of forage available. The relative percentage of annual vegetative production by weight is 40 percent grasses, 40 percent trees and shrubs and 20 percent herbaceous plants and vines. Adverse soils conditions make it infeasible to convert this community to cropland. It has been converted to some extent for citrus production in South Florida.

Woodland: Sand scrubs are good producers of sand pine and some areas are utilized for commercial wood production. Intensive management for wood production will not cause excessive damage to the community if good silvicultural practices are applied. There are severe equipment limitations and moderate seedling mortality problems due to loose, well to excessively well-drained and infertile soil conditions. Sand pine is a commercial species suitable for planting. It has a potential annual growth of approximately 0.5 cords per acre in North Florida. South of Hernando County in the west and Orange County in the east, the potential annual growth is 0.4 cords per acre.

Urbanland: The moderately well to excessively well drained areas have few limitations for urban development. The somewhat poorly drained Satellite soils, although very droughty in the surface layers, have a water table at 20 inches for part of the year and has more limitations. Vegetation is difficult to establish because of the infertile, coarse textured, and droughty surface soils. Water moves rapidly through the soil. Intensive vegetation establishment and maintenance methods, including irrigation are needed for best results. Without vegetation, wind erosion can be a problem during and after construction. Water erosion control and water retention facilities are usually not needed. Plants native to the community should receive preference for beautification and landscaping. This is because they are more easily established and require less maintenance. Some of the trees are: Live oak, sand live oak, sand pine, turkey oak (*Quercus laevis*), and eastern red cedar (*Juniperus silicicola*). Some of the shrubs are: Spanish bayonet (*Yucca aloefolia*), coral bean (*Erythrina herbaceae*), gopher apple, pawpaw (*Asimina* spp.), prickly pear cactus (*Opuntia* spp.), rosemary

(*Ceratiola ericoides*), saw palmetto, and shining sumac (*Rhus copallinum*). Some of the herbaceous plants are: Asters, blanketflower (*Gaillardia pulchella*), blazing star (*Liatris* spp.), golden aster (*Pityopsis graminifolia*), goldenrods (*Solidago* spp.), lupine (*Lupinus* spp.), morning glories (*Ipomoea* spp.), and beach dune sunflower (*Helianthus debilis*).

NSLP 10: Dunes and Central Ridge

Dune and Central Ridge landscapes are well-drained, non-hydric, high upland soils with sandy marine sediment throughout the profile. These soils are typically populated with xeric species. The seasonal high water table is more than six feet below the soil surface throughout the year. Common soils of this landscape position include Chandler, Palm Beach, Paola, and St. Lucie.

One ecological community that is typical of this landscape position is the South Florida Coastal Strand (#2), described below. Another community that may be found on this landscape position is Sand Pine Scrub (#3).

SOUTH FLORIDA COASTAL STRAND (ECOLOGICAL COMMUNITY NO. 2)

Range: The South Florida Coastal Strand ecological community occurs along the Atlantic Ocean south of Brevard County and along the Gulf of Mexico south of Pasco County. Individual communities are generally large in size, being narrow, long, and parallel to the coastal beaches. Small, isolated communities can also be found along some bays or sounds. This community generally encompasses the area affected by salt sprays from the ocean, Gulf and salt water bays.

Soils: The soils are nearly level to strongly sloping, deep, mostly well to excessively drained with some moderately well drained or somewhat poorly drained. They are coarsely textured throughout. Representative soils include: Canaveral and Palm Beach. It also includes areas mapped as Coastal Beach and Coastal Beach Ridges.

Vegetation: The natural vegetation of this community is low growing grasses, vines, and herbaceous plants with few trees or large shrubs. These trees and shrubs often occur in stunted form due to the action of the wind. The natural forces of wind, salt, and blowing sand make plant establishment difficult on the foredunes. Plants which do establish here are well adapted to disturbance and are pioneer species. The backdunes will often have vegetation similar to the sand pine scrub or the wetland hardwood hammock ecological communities. Plants which characterize this community are: Cabbage palm (*Sabal palmetto*), coconut palm (*Cocos nucifera*), sand live oak (*Quercus virginiana* var. *maritima*), bay cedar (*Suriana maritima*), inkberry (*Scaevola plumieri*), marshelder (*Iva imbricata*), saw palmetto (*Serenoa repens*), silverleaf croton (*Croton punctatus*), Spanish bayonet (*Yucca aloefolia*), sea grape (*Coccoloba uvifera*), bay bean (*Canavalia maritima*), beach morning-glory (*Ipomoea pes-caprae*), beach dune sunflower (*Helianthus debilis*), sea purslane (*Sesuvium portulacastrum*), sea oats (*Uniola paniculata*), seashore paspalum (*Paspalum vaginatum*), seashore saltgrass (*Distichlis spicata*). The following endangered or threatened plants may occur in this community: Beach star (*Remirea maritima*), small flowered lily-thorn (*Catesbaea parviflora*, Florida Keys), burrowing four-O'clock (*Okenia hypogaea*), sea lavender (*Mallatonia gnaphalodes*), beach creeper (*Ernodea littoralis*), west coast prickly apple (*Cereus gracilis*), and the fragrant prickly apple (*Cereus eriophorus* var. *frangrans*, St. Lucie County).

Wildlife: A variety of shorebirds, terns, and gulls can be found on or near the beach. This community provides good food sources as well as nesting sites. Small mammals can also be found on the coastal dunes. Larger mammals also occur behind the foredunes. Some species that occur are: Bobcat (*Lynx rufus*), eastern spotted skunk (*Spilogale putorius*), raccoons (*Procyon lotor*), mice, American kestrel (*Falco sparverius*), pelicans, gulls, terns, shorebirds, songbirds, frogs, and lizards. This area also serves as nesting grounds for sea turtles. Crustaceans such as crabs are numerous near the

shorelines. The following protected species may be found in or around this community: Pallid beach mouse (*Peromyscus polionotus decoloratus*), Goff's pocket gopher (*Geomys pinetis goffi*), peregrine falcon (*Falco peregrinus tundrius*), piping plover (*Charadrius melodus*), Southeastern snowy plover (*Charadrius alexandrinus tenuirostris florida*), least tern (*Sterna antillarum*), Atlantic green turtle (*Chelonia mydas mydas*, Atlantic coast only), Atlantic hawksbill turtle (*Eretmochelys imbricata imbricata*), Atlantic loggerhead turtle (*Caretta caretta caretta*), Atlantic ridley turtle (*Lepidochelys kemp*), and the Leatherback turtle (*Dermochelys coriacea*).

Environmental Value as a Natural System: The coastal strand is highly endangered. Areas privately owned but undeveloped are in demand for residences, hotels and motels. This urban development can have serious effects on the community. Coastal strands are important in regulating wave action along the coast. This action tends to break away part of one beach and build up another. Unplanned structures and development which alter this process accelerates beach and coastal dune erosion through removal of native vegetation, which helps hold the dune together, and by removal of sand from the offshore transport system. Recreational use and wildlife values on the coastal strand are important. Recreation is much in demand in these areas but can cause damage due to trampling and destroying vegetation. When these plants die, their extensive root systems are no longer available to hold the soil together and build the dune. Occasional use may also degrade this fragile community.

Rangeland: This community is not generally used for rangeland.

Woodland: This community is not generally used for woodland.

Urbanland: The better drained areas inland from the ocean or Gulf have few limitations for urban development. Areas adjacent to the water may be subject to coastal dune and beach erosion. This is especially true where construction alters the natural processes and destroys excessive amounts of native vegetation. Vegetation is difficult to establish because of the infertile, coarse textured, well to excessively well drained and saline soils and the salt spray. Intensive vegetation establishment and maintenance methods are needed for best results. Without vegetation, water and wind erosion can become a problem during and after construction. Plants native to the community should receive preference for beautification and landscaping. This is because they are more easily established and require less maintenance. Some of the trees are: Cabbage palm, coco plum (*Chrysobalanus icaco*), Florida thatch palm (*Thrinax* spp.), Florida silver palm (*Coccothrinax argentata*), live oak (*Quercus virginiana*), pigeon plum (*Coccoloba diversifolia*), redbay (*Persea borbonia*), slash pine (*Pinus elliottii* var. *densa*), magnolia (*Magnolia grandiflora*), wild tamarind (*Lysiloma latisiliqua*), and sand pine (*Pinus clausum*). Some of the shrubs are: Prickly pear cactus (*Opuntia* spp.), sea grape (*Coccoloba uvifera*), coontie (*Zamia pumila*), coral bean (*Erythrina herbaceae*), yaupon holly (*Ilex vomitoria*), lantanas, partridge pea (*Cassia* spp.), marsh elder (*Iva* spp.), saw palmetto, Spanish bayonet and waxmyrtle (*Myrica cerifera*). Some of the grasses and herbaceous plants include: Sea oats (*Uniola paniculata*), marsh hay cordgrass (*Spartina patens*), seashore dropseed (*Sporobolus virginicus*), blanket flower (*Gaillardia pulchella*), sea purslane (*Sesuvium portulacastrum*), and wild grape (*Vitis rotundifolia*).